

## **CLEAN AIR ACT SECTION 112(r) INSPECTION REPORT**

### ***Mayaguez Regional Wastewater Treatment Plant***

***(Puerto Rico Aqueduct and Sewer Authority)***

***Mayaguez, PR***

#### **GENERAL INFORMATION**

<b>Stationary Source</b>	Mayaguez Regional Wastewater Treatment Plant
<b>Date of Inspection</b>	December 7, 2010
<b>USEPA Inspector</b>	Francesco Maimone – USEPA, REGION II (Edison, NJ)
<b>Contract Auditor</b>	Neil Mulvey, OHC (Subcontractor)
<b>Description of Activities</b>	<ul style="list-style-type: none"><li>• Opening meeting with facility representative.</li><li>• Program audit.</li><li>• Closing meeting with facility representatives.</li></ul> Program audit consisted of the following activities: <ol style="list-style-type: none"><li>1. Document review.</li><li>2. Field verification.</li><li>3. Personnel interviews</li></ol>

#### **STATIONARY SOURCE INFORMATION**

<b>EPA Facility ID #</b>	1000 0012 5777
<b>Date of Latest Submission (used for RMP inspection)</b>	Postmark Date: November 30, 2007 (Re-submission) Receipt Date: December 4, 2007 (Re-submission) Anniversary Date: November 30, 2012
<b>Facility Location</b>	PR Road # 342 Km. 0.5 Mayaguez, PR 00783 Mayaguez County  Tel. (787) 406-4727
<b>Number of Employees</b>	RMP*Submit states 24 employees (per RMP registration) Facility reported 19 employees at time of inspection Union workforce- Unione Independente Autentica (UIA)

<b>Description of Surrounding Area</b>	The facility is located on 35 acres in a rural / residential area north of Mayaguez. The facility is surrounded by a significant amount of open space on all sides. The nearest resident, however, is approximately 700-ft. to the northwest.
<b>Participants</b>	<p>Participants included:</p> <p><b>Francesco Maimone</b>, USEPA – Region II, Edison, NJ <b>Neil Mulvey</b> – USEPA SubContractor <b>Carlos Huertas</b>, RST2 – USEPA Contractor <b>Jessika M. Colon</b>, Compliance Officer, West Region – AAA/PRASA <b>Yul Bermudez</b>, Compliance Officer – AAA/PRASA + <b>Ebdiel Escobar</b>, Compliance Manager, West Region – AAA/PRASA <b>Jorge L. Jimenez</b>, Supervisor General Plant – AAA/PRASA* <b>Jorge Hernandez Ortiz</b>, Operations Supervisor – AAA/PRASA <b>Morgan J. Rivera</b> – AAA/PRASA</p> <p>* Designated RMP Manager + Lead RMP Manager</p>

## REGISTRATION INFORMATION

<b>Process ID #</b>	73040 – Chlorine Injection
<b>Program Level (as reported in RMP)</b>	Program 3
<b>Process Chemicals</b>	Chlorine @ 54,000-lbs.
<b>NAICS Code</b>	22132 (Sewage Treatment Facilities)

## GENERAL COMMENTS

The Mayaguez Regional Wastewater Treatment Plant (WWTP) is one of many water and wastewater facilities owned and operated by the Puerto Rico Aqueduct and Sewer Authority (PRASA). The facility operates as an advanced secondary treatment system, including two primary clarifiers and two sludge thickeners. The original design capacity of the facility is 28 million gallons per day (MGD), with a permitted capacity of 22.3 MGD. The facility typically operates at 11 MGD average, receiving a mix of residential, commercial, and industrial wastewater. The WWTP serves approximately 150,000 residents.

The facility operates 24 hours a day, 7 days a week with three shifts and at least one Operator on-site at all times. A Supervisor is on-site during day shifts. The facility employs one Facility Manager, an Operations Supervisor, and four Operators. 100% of the sludge generated from the treatment process is handled at the on-site compost facility.

The facility handles chlorine in 1-ton containers. The chlorine process includes a chlorine container storage area (i.e., chlorine building), chlorination room, and injectors. The chlorine building has a fixed roof with open sides. The chlorine building houses full and empty chlorine containers and two scales, each containing three 1-ton containers. One set of three containers is on-line feeding chlorine while the other set is stand-by, activated via automatic switchover. A vacuum regulator is mounted on each 1-ton chlorine container. Flexible polyethylene hose carries chlorine gas from the vacuum regulators to a polyvinyl chloride (PVC) manifold. The PVC manifold is piped through a cinder block wall into the chlorination room.

The average use of chlorine is approximately 265-lbs. per day. The facility is registered for a maximum of twenty-seven 1-ton chlorine containers on-site at any time. At the time of this inspection, there were thirteen 1-ton containers in storage and six 1-ton containers on the two scales (three containers each). Containers are delivered from PRASA's San Juan Distribution Center approximately every two months (8 – 10 containers per delivery).

The plant also uses 150-lb. chlorine cylinders for chlorine injection at the sludge thickeners. These cylinders are located inside a chlorine shed. Approximately 10 – 15-lbs. per day of chlorine is used at the sludge thickeners. At the time of this inspection there were three 150-lb. chlorine cylinders in the chlorine shed and one 150-lb. cylinder on-line.

The process includes chlorine detectors (3 PPM alarm setpoint) located as follows:

- Chlorine building (1)
- Chlorination room (1)
- 150-lb. Cylinder chlorine shed (1)

Important characteristics of chlorine include:

- Chlorine gas is primarily a respiratory irritant.
- Greenish-yellow gas with extremely pungent irritating odor
- Chlorine liquid is clear amber in appearance
- Exists as a gas at room temperature with a boiling point of -29 °F
- Considered a dense gas (weighs 2.5 times as much as air)
- Non-explosive or flammable
- Odor threshold is 0.2 – 0.4 PPM
- IDLH is 10 PPM
- Many organic chemicals react readily with chlorine, sometimes violently

## **RMP DOCUMENTATION**

The facility's written Risk Management Program procedures are contained in an RMP/PSM Manual (most recently revised in November 2010), which contained written procedures for each of the required program elements. The Manual was certified by the General Plant Supervisor on May 11, 2010. The description of each Risk Management Program element in the Manual includes a purpose, scope, objectives, responsibilities, and specific procedure. The Manual is supplemented by various forms and documents showing implementation of the Risk Management Program procedures. Supplemental documentation is maintained in individual folders organized by Risk Management Program element.

### **Registration**

The facility's most recent Risk Management Plan, submitted on November 30, 2007, contained adequate registration information.

### **Management System [40 CFR 68.15]**

The facility has a Management System that assigns an individual/title for overall responsibility in implementing the Risk Management Program. Responsibility for several Risk Management Program elements is delegated to others at the facility through an organizational chart.

The facility's November 30, 2007 Risk Management Plan (RMP) re-submission indicates that Mr. Jose A. Capeles, PRASA Compliance & Quality Control Director, is the individual who has the overall responsibility for implementation of the facility's Risk Management Program. This information conflicts with what appears to be implemented at the facility, which indicates that this is the Plant Supervisor's role. The EPA recommends that the facility perform a correction in RMP\*eSubmit, so that the facility's submitted RMP is consistent with implementation at the facility.

### **Hazard Assessment [40 CFR 68.22 – 68.39]**

The facility has performed appropriate Worst Case (WC) and Alternate Case (AC) scenarios. The facility used the RMP\*Comp program in order to determine the distance-to-endpoint estimates under the WC and AC scenarios. The RMP\*Comp program inherently contains the appropriate release temperatures, atmospheric stability class, and wind speeds appropriate for each scenario. The facility has determined the surface roughness for each scenario to be “urban”, although the facility should evaluate whether a “rural” surface roughness would be more appropriate.

The facility used Landview software, which contains the most recent 2000 Census data, to determine potentially impacted population sizes within each distance-to-endpoint. Marplot was also used to visually display the WC and AC distance-to-endpoint circles, and to identify environmental receptors within potentially impacted WC and AC circles.

Although the facility correctly applied RMP\*Comp, Landview 6, and Marplot software in 2004, the facility did not complete a 5-year revalidation of its Hazard Assessment information in February 2009. Specifically, the facility used the Area Locations of Hazardous Atmospheres (ALOHA) model software in February 2009 during its attempt to perform a five-year Hazard Assessment revalidation; however, the ALOHA model information contained inaccurate WC scenario parameters, did not contain an AC scenario model run, and was determined to be incomplete.

### **Five-Year Accident History [40 CFR 68.42]**

An interview of employees and discussion with facility management indicated that less than 10-lbs. of chlorine were released by the facility as a result of defective threading on a cylinder valve in 2008. As a result of the incident, an operator who facility management indicated was not exposed was sent to the hospital as a precautionary measure. Because the operator was sent to the hospital as a precautionary measure, five-year accident history procedures were not required to be implemented.

### **Process Safety Information (PSI) [40 CFR 68.65]**

Documentation included a written description of PSI. PSI information available for review included:

- Chlorine MSDS
- Block flow diagram (BFD); dated 10/17/07
- Description of process chemistry
- Maximum intended inventory
- Piping and instrument diagrams (P&ID); dated 10/8/10
- Description of electrical classification as ‘general purpose’
- List of codes / standards employed (e.g., Chlorine Institute pamphlets)

Written operating procedures included a table describing the consequences of deviating from normal operating conditions, including item / parameter, possible causes, description of item to check, and solution / corrective action.

The following PSI was not available for review:

- Description of design of ventilation system in the chlorination room

The facility has a statement indicating that process equipment complies with recognized and generally accepted good engineering practices (RAGAGEPs). It is recommended, however, that the facility bolster its RAGAGEP statement by listing applicable industry standards and evaluating the facility's conformance with these standards.

A random spot check of installed equipment / instruments versus the Piping and Instrumentation Diagram (P&ID) was performed. Equipment configuration and arrangement was consistent with the (P&ID). The P&ID was deficient, however, in the following areas:

- No designation of type of chlorine transfer piping (i.e., polyethylene or PVC or other?) or line size
- Indication of direction of chlorine flow
- No designation of vent or discharge points to atmosphere
- Insufficient detail on the 1-ton container mounted vacuum regulators

#### **Process Hazard Analysis (PHA) [40 CFR 68.67]**

The RMP/PSM Manual included a written description for conducting PHAs. The Manual described a "What-If / Checklist" analysis technique, however, the method used was a Checklist. The most recent PHA was conducted during a session on August 14, 2008. Documentation of that review included:

- List of participants including operators, managers, and compliance officers
- Summary of recommendations: three for the main chlorine system and two for the 150-lb. cylinder area
- Separate checklists for main chlorine system and 150-lb. cylinder area

The checklist PHA was not effective in:

- Evaluation of a range of the possible safety and health effects of failure of controls

The PHA did not include an evaluation of facility siting.

There was incomplete documentation on the resolution of the five recommendations identified during the August 14, 2008 PHA.

PHAs prior to the August 14, 2008 PHA were not present at the facility on the date of inspection, although results from other PRASA inspections indicate that older PRASA PHAs might be retained at PRASA headquarter offices. The facility's November 30, 2007 RMP re-submission indicates that a PHA was performed on August 5, 2004, and the facility's June 21, 1999 first-time RMP submission indicates that a PHA had been performed on June 10, 1999.

### **Standard Operating Procedures (SOPs) [40 CFR 68.69]**

The RMP/PSM Manual included a description of existing SOPs. The SOPs included a task description for various operating conditions, including:

- Start-up
- Normal operation
- Emergency operation
- Shutdown
- Tables include description of operation, location, task description, and comments

There were no SOPs readily available for receipt and off-loading of full 1-ton containers and 150-lb. cylinders, and loading of empty containers and cylinders.

The SOPs included a table describing consequences of deviation from normal operating conditions, including item/parameter, possible causes, description of item to check, and solution / corrective action.

SOPs also included procedures for performing routine maintenance.

Documentation also included a manual of PRASA SOPs, including:

- Incident investigation
- Confined space
- Lock-out/Tag-out
- Calibration procedure
- Emergency operations

The following SOP checklists were reviewed:

- Checklist for cylinder changing - 11/10/10
- Checklist for normal operation - 11/12/10
- Checklist for start-up
- Checklist for shutdown
- Daily shift checklist

It appears from this review that the facility is implementing the SOPs through use and documentation on these checklists.

The checklist for cylinder changing requires that “PPE” be worn for this procedure, but does not list which PPE. An SOP table lists specific PPE, including respirator with cartridges, gloves, apron, and safety shoes. Adding this list of required PPE to the actual checklist may help to ensure proper donning of PPE when changing chlorine cylinders.

#### **Training [40 CFR 68.71]**

The facility provides initial and refresher training to employees. Initial training includes discussion on physical properties of chlorine, dangers of chlorine, description of the facility’s chlorine process and equipment, operating procedures, and mechanical integrity. During initial training operators are also required to visually demonstrate sufficient operation of process equipment to designated trainers. A written test, regarding the safe use of chlorine, is completed by each operator completing initial and refresher training. Sign-in sheets were maintained for several initial and refresher training sessions.

Initial and refresher training certificates are maintained by the PRASA training office. The facility, however, did not have available sufficient records that each operator has been initially trained. Facility personnel indicated that these records/certificates could have been lost during a transition of training records from the facility to the PRASA training office.

Although the facility performs initial and refresher training, training requirements and documentation were not clearly organized. It is recommended that the facility clearly identify and adequately document specific training sessions required to meet Risk Management Program initial and refresher training requirements.

#### **Mechanical Integrity [40 CFR 68.73]**

The RMP/PSM Manual included a written description of the facility mechanical integrity (MI) program. The MI program included procedures for addressing deficiencies identified during equipment inspections and tests. The MI program included a written procedure for Instrument Calibrations (Procedure # 806).

The MI program included a table listing equipment in the process and frequency and type of inspection and test performed. There is no description of the basis for the scheduled inspection and test frequency. Additionally, this table does not include all equipment used in the chlorine process, such as vacuum regulators, alarm system, and *Vega* gas arrestors. While the polyethylene line is included in daily visual inspection, there is no schedule for replacement.



Randomly selected inspection and test records were reviewed (overhead crane, chlorine detectors, SCBAs) and the following observations were noted:

- Some daily recordkeeping did not have supervisor signature or dates documented on log sheets
- None of the weekly or monthly scheduled inspections and tests have been performed per the established schedule (except for monthly inspection of SCBAs)
- Dates of quarterly calibration of the three chlorine detectors; it is noted that the documentation on-file at the facility included a signed certification that the calibration was completed, however the actual record of calibration is maintained at PRASA corporate or regional offices.

#### **Management of Change (MOC) [40 CFR 68.75] & Pre-Startup Review (PSR) [40 CFR 68.77]**

The RMP/PSM Manual included written procedures for MOC and PSR. The MOC / PSR procedure included a form for documenting and authorizing changes, including a checklist identifying Risk Management Program documents that will require updating as a result of the change.

There was no documentation available for review regarding completed MOC / PSR reviews. Discussions with facility management identified the following facility changes that should have been reviewed per the facility MOC / PSR procedure:

- Installation of the *Vega* gas arrestors at each connected 1-ton chlorine container (per facility management this system was installed in approximately June 2009)
- Changes to plant-wide chlorine alarm / notification system

#### **Compliance Audits [40 CFR 68.79]**

The RMP/PSM Manual included a written procedure for conducting compliance audits. PRASA's Health & Safety Office is responsible for conducting Risk Management Program compliance audits at least once every three-years. The compliance audit procedure included a checklist for documenting the audit.

The most recent RMP/PSM compliance audit was conducted on October 6, 2010 and is documented in a Compliance Audit Report dated November 24, 2010. The audit was conducted by an outside consultant (Ana Gloria Ramos, P.E., Sharetech) and included participation from facility employees including Yul Bermudez, Julio Ocasio (Compliance Officer, PRASA), Jorge Jimenez (Plant Supervisor), and Marcelo Rivera (Plant Supervisor).

The report was complete and comprehensive with a detailed description of the audit methodology. Documentation included completion of the USEPA RMP Checklist. The audit identified 15 recommendations for follow-up.

The audit report of November 24, 2010 was significantly more comprehensive and complete than the previous RMP/PSM audit that was conducted as an internal audit on April 14, 2008. Documentation of this audit is contained in a letter / checklist-type report. Several recommendations were identified.

The facility also had a copy of a Risk Management Program inspection report prepared by the Puerto Rico Environmental Quality Board (EQB), dated October 31, 2010, of a May 2010 EQB Risk Management Program inspection. The facility has prepared a table of the EQB Risk Management Program inspection findings and is actively taking action to address those findings.

#### **Incident Investigation [40 CFR 68.81]**

Incident Investigation procedures are required to be implemented when catastrophic releases of a regulated substance occurs, or when an incident could have reasonably resulted in a catastrophic release (near-miss). Facility personnel and the facility's RMP history indicated that it has not had any catastrophic releases or near-miss incidents.

If a catastrophic release or near-miss event were to occur, the facility would document incident investigations by completing the following template form: "Formulario P.1 Investigacion de Incidente". This form documents several required elements of an incident investigation, such as date of incident and contributing factors, and documents changes resulting from the investigation. Although this form documents changes as a result of the incident investigation, the form does not specifically document findings and recommendations that lead to changes resulting from the investigation, as required by 40 CFR 68.81(d)(5). Additionally, the incident investigation procedures and documentation did not contain an adequate system to promptly address, resolve, and document findings and recommendations from incident investigation reports, as required by 40 CFR 68.81(e). It is recommended that "Formulario P.1 Investigacion de Incidente" be revised so that it ensures that all Incident Investigation requirements would be covered in case an applicable incident occurs.

#### **Employee Participation [40 CFR 68.83]**

The facility has an Employee Participation Plan that is implemented at the facility. Risk Management Program documentation maintained at the facility states that the Employee Participation Plan, and other Risk Management Program documentation, are available to employees in a copy of the "RMP Binder" that is dedicated for their use. According to the facility's Employee Participation Plan, the facility's Plant Supervisor is responsible for implementing the Employee Participation Plan. Additionally, the Employee Participation Plan indicates that the facility is committed to Safety Committee Meetings every six months, an Employee Training Program, and a Notification Bulletin Board. The six-month Safety Committee Meetings, however, have not been performed.

Employee Participation requires that operators be included on PHA teams. The facility's most recent PHA included operators as members of the PHA team.

The EPA Risk Management Program inspection also included employee interviews in order to evaluate implementation of the Employee Participation Plan and other elements of the facility's Risk Management Program. Employees expressed that the Employee Participation Plan is not being fully implemented, as evidenced by operators who indicated that they do not feel sufficiently prepared to don Self-Contained Breathing Apparatuses (SCBAs), troubleshoot chlorine cylinders with emergency chlorine kits, and perform emergency operations procedures. According to an operator, an emergency response drill last took place approximately two years ago; thus, the operator feels inadequately prepared to handle chlorine emergency responses.

#### **Hot Work Permit [40 CFR 68.85]**

Hot Work Permit procedures are discussed in the facility's Risk Management Program documentation. These procedures were consistent with Hot Work Permit requirements identified in 40 CFR 68.85. The facility implements its Hot Work Permit Program.

#### **Contractor Safety [40 CFR 68.87]**

The facility communicates safety procedures to all contractors. Contractors are required to sign that they have received and understood PRASA Mayaguez's safety briefing. The facility identifies its Contractor Safety procedures in the RMP/PSM Binder.

The facility has not recently retained the services of contractors in performing maintenance or repair, turnaround, major renovations, or specialty work on or adjacent to the chlorine process.

Facility management indicated that they are not involved in the selection of contractors to work at or near the chlorine process. Rather, facility management indicated that such decisions are made by PRASA's purchasing department. It is recommended that this practice is reflected in the facility's procedures and policies and implemented when contractors are used at or near the chlorine process. Additionally, please be reminded that a periodic evaluation of contractor training, safety requirements, and safe work practices must be performed whenever contractors are used at or near the chlorine process.

#### **Emergency Response [40 CFR 68.90 – 68.95]**

During the inspection, facility personnel indicated that operators are expected to respond to certain chlorine releases. A review of the facility's emergency response documents indicated that operators are required to don Self-Contained Breathing Apparatuses (SCBAs) for identifying leak sources and performing emergency repair operations with Chlorine A or B kits. The facility is considered a limited first responder because it instructs its operators to perform emergency repair operations when concentrations are 9

parts per million (ppm) or less. The facility's procedures indicate that local and commonwealth authorities are activated for releases greater than 9 ppm.

The facility has an Emergency Response Plan dated April 2010, that references PRASA's Procedimiento 945 "Programa De Seguridad En Emergencias Por Escape De Cloro", dated March 26, 2008. The Emergency Response Plan includes an emergency call-down list for local and commonwealth authorities, identifies and outlines the facility's Incident Command System (ICS), and discusses evacuation procedures. Procedimiento 945 includes discussion of first-aid and emergency medical treatment.

The facility has procedures for the use, inspection, and testing of SCBAs. A monthly inspection record was reviewed for a Chlorine B kit in the chlorinator room; however; a monthly inspection record was not completed for the facility's Chlorine A kit. Additionally, information obtained from PRASA Mayaguez's Clean Air Act Section 114 response revealed that the facility has not employed appropriate qualitative or quantitative fit-testing methods for SCBAs and filter-based respirators. The facility must ensure that its Emergency Response Program includes and implements appropriate procedures for the use of emergency response equipment and for its inspection, testing, and maintenance, as required by 40 CFR 68.95(a)(2).

Facility personnel indicated that emergency response drills have been scheduled, but not actually conducted. As a result, facility personnel do not feel prepared to mitigate chlorine releases. The facility must ensure that employees involved in emergency response are adequately trained in emergency response procedures, as required by 40 CFR 68.95(a)(4).

Although a facility employee is a member of the Mayaguez Emergency Response Planning Committee, it is recommended that the facility further coordinate emergency response efforts with local response authorities. Such coordination ensures that these authorities are capable of responding to release scenarios for which Mayaguez Wastewater Treatment Plant personnel are not trained to handle (i.e. substantial releases and chlorine atmospheres greater than 9 ppm).

## **FACILITY TOUR**

Several items noted during the facility tour include:

- Facility practice is to paint all chlorine lines yellow. A carbon steel chlorine line at the water injector near the effluent pit was painted a gray color and was not labeled. Also, external corrosion was observed at a pipe supporting the line. Within two days of these observations, PRASA produced photographic evidence that the line was painted yellow and labeled as chlorine with flow direction arrows. Also, the external corrosion had been addressed.
- The exhaust ventilation fan in the chlorination room is manually activated. Facility management explained that this was preferable for them rather than automatic

activation of fan when door is opened or interlock to chlorine detector. Facility management explained that, in the event of a chlorine release inside the chlorination room, they would rather control if / when chlorine is vented outside room rather than automatic activation.

## FINDINGS

### **Hazard Assessment [40 CFR 68.22 – 68.39]**

- ❑ The facility correctly applied RMP\*Comp, Landview 6, and mapping software in 2004, however, the facility's February 2009 Hazard Assessment re-validation, featuring ALOHA, was determined to be incorrect and incomplete. **The facility must review and update its offsite consequence analyses at least once every five years, as required by 40 CFR 68.36(a).**

### **Process Safety Information (PSI) [40 CFR 68.65]**

- ❑ A P&ID of the process was available for review. However, the P&ID is deficient, in the following areas:
  - No designation of type of chlorine transfer piping (i.e., polyethylene or PVC or other?) or line size
  - Indication of direction of chlorine flow
  - No designation of vent or discharge points to atmosphere
  - Better detail on the 1-ton container mounted vacuum regulators

**The facility must develop the required P&ID, as required by 40 CFR 68.65(d)(1)(ii).**

- ❑ PSI not available for review included a description of design of ventilation system in the chlorination room. **The facility must develop PSI including design of ventilation in the chlorination room, as required by 40 CFR 68.65(d)(1)(v).**

### **Process Hazard Analysis (PHA) [40 CFR 68.67]**

- ❑ The PHA conducted on August 14, 2008 was not effective in evaluating a range of the possible safety and health effects of failure of controls. The PHA also did not evaluate facility siting. **The facility must ensure that completed PHAs evaluate a range of possible safety and health effects of failure of controls, and consider facility siting, as required by 40 CFR 68.67(c)(5), and (7).**
- ❑ There was incomplete documentation on the resolution of the five recommendations identified during the August 14, 2008 PHA. **The facility must ensure that documentation of the resolution of PHA recommendations is maintained on-file, as required by 40 CFR 68.67(e).**

- ❑ PHAs prior to the August 14, 2008 PHA were not present at the facility on the date of inspection, although results from other PRASA inspections indicate that older PRASA PHAs might be retained at PRASA headquarter offices. The facility's previous RMP submissions indicate that PHAs have been performed prior to the August 14, 2008 PHA. **Process Hazard Analyses and their updates/revalidations have not been maintained for the life of the process, as required by 40 CFR 68.67(g).**

**Standard Operating Procedures (SOPs) [40 CFR 68.69]**

- ❑ There was no SOP readily available for receipt and off-loading of full 1-ton chlorine containers and 150-lb. cylinders and loading empty containers and cylinders. **The facility must ensure that written operating procedures exist for all chlorine handling operations, including the receipt and movement of full 1-ton chlorine containers and 150-lb. cylinders and movement of empty containers and cylinders, as required by 40 CFR 68.69(a)(1)(ii).**

**Training [40 CFR 68.71]**

- ❑ The facility did not retain sufficient records that each operator has been initially trained. Facility personnel indicated that these records/certificates could have been lost during a transition of training records from the facility to the PRASA training office. **The facility must ensure that operator training is received, understood, and that appropriate records documenting such training are prepared, as required by 40 CFR 68.71(c).**

**Mechanical Integrity [40 CFR 68.73]**

- ❑ The preventive maintenance inspection and test schedule (Table J.1) does not include all equipment used in the chlorine process, such as vacuum regulators, alarm system, and *Vega* gas arrestors. While the polyethylene line is included in daily visual inspection, there is no schedule for replacement. **The facility must ensure that the mechanical integrity has established inspection and test procedures for all equipment in the covered process, including vacuum regulators, alarm system, *Vega* gas arrestors, and polyethylene line, as required by 40 CFR 68.73(d)(1).**
- ❑ None of the weekly or monthly scheduled inspections and tests has been performed per the established schedule (except for monthly inspection of SCBAs). **The facility must ensure that equipment inspections and tests are performed in accordance with established schedules, as required by 40 CFR 68.73(d)(1).**
- ❑ The MI program includes a table listing equipment in the process and frequency and type of inspection and test performed. There is no description of the basis for the scheduled inspection and test frequency. **The MI program must include a**

**basis for the frequency of established inspections and tests, as required by 40 CFR 68.73(d)(3).**

- ❑ Some daily recordkeeping of completed equipment inspections did not have supervisor signature or dates documented on log sheets. **The facility must ensure that documentation of completed inspections and tests include identification of date completed and identification of employees involved with the inspection and test, as required by 40 CFR 68.73(d)(4).**

#### **Management of Change (MOC) [40 CFR 68.75]**

- ❑ There was no documentation available for review regarding completed MOC / PSR reviews. Discussions with facility management identified the following facility changes that should have been reviewed per the facility MOC / PSR procedure:
  - Installation of the *Vega* gas arrestors at each connected 1-ton chlorine container (per facility management this system was installed in approximately June 2009)
  - Changes to plant-wide chlorine alarm / notification system

**The facility must ensure that MOC reviews are completed, authorized, and documented as required by 40 CFR 68.75(a).**

#### **Emergency Response [40 CFR 68.90 – 68.95]**

- ❑ The facility has not performed adequate fit-testing methods for respirators (SCBAs- emergency, and filter-based- cylinder change-out), and not completed sufficient monthly inspections for a Chlorine A Kit. **The facility must ensure that its Emergency Response Program includes and implements appropriate procedures for the use of emergency response equipment, and for its inspection, testing, and maintenance, as required by 40 CFR 68.95(a)(2).**
- ❑ Facility personnel indicated that emergency response drills have been scheduled, but not actually conducted. **The facility must ensure that employees involved in emergency response are adequately trained in emergency response procedures, as required by 40 CFR 68.95(a)(3).**

## **RECOMMENDATIONS**

#### **Management System [40 CFR 68.15]**

Although Mr. Jose Capeles might be responsible for implementing the Risk Management Program for all PRASA facilities, the Plant Supervisor is responsible for implementing the Risk Management Program at the Mayaguez Regional Wastewater Treatment Plant.

As a result, please submit a correction in RMP\*eSubmit to reflect Mr. Jimenez as the person responsible for implementing the Risk Management Program at the facility.

#### **Hazard Assessment [40 CFR 68.22 – 68.39]**

The facility's Hazard Assessment calculations, as performed in 2004, correctly used RMP\*Comp to determine Worst Case (WC) and Alternate Case (AC) distance-to-endpoint estimates. RMP\*Comp is simple to use, while ALOHA might require additional knowledge. The EPA requests that your facility determine the offsite consequence analysis methodology it would like to employ, and update its RMP in RMP\*eSubmit in order to reflect the methodology chosen.

Additionally, the facility has determined the surface roughness for each Worst Case and Alternate Case scenario to be "urban", although the facility should evaluate whether a "rural" surface roughness would be more appropriate. Your facility's determination should be based on EPA guidance, and should include evaluation of obstructions, topography, and vegetation.

Offsite consequence analysis guidance can be found at the following EPA website:  
<http://www.epa.gov/osweroe1/docs/chem/Chap-04-final.pdf>

#### **Process Safety Information (PSI) [40 CFR 68.65]**

The facility has a statement indicating that process equipment complies with recognized and generally accepted good engineering practices (RAGAGEPs). It is recommended, however, that the facility bolster its RAGAGEP statement by listing applicable industry standards and evaluating the facility's conformance with these standards. This is often performed by a group or individual with sufficient knowledge and expertise in chlorine system operations.

#### **Standard Operating Procedures (SOPs) [40 CFR 68.69]- Health & Safety**

The facility's maintenance procedures provide instruction on required inspection of filter-based respirators, which are used during cylinder change-out. The facility's February 10, 2011 response to EPA's January 18, 2011 Clean Air Act Section 114 Information Request indicated that the facility has not implemented these procedures, which includes standard maintenance for these respirators. Operators have not received fit-testing for use of these respirators during cylinder change-out. It is recommended that the facility implement respirator maintenance procedures and fit-test operators for the safe use of these filter-based respirators.

#### **Training [40 CFR 68.71]**

Although the facility performs initial and refresher training, training requirements and documentation were not clearly organized. It is recommended that the facility clearly



identify and adequately document specific training sessions required to meet Risk Management Program initial and refresher training requirements.

#### **Incident Investigation [40 CFR 68.81]**

“Formulario P.1 Investigacion de Incidente” is a template-based form, with checkmark boxes for several important items including cause of incident, contributing factors, and changes as a result of the incident investigation. It is the experience of this office that checkmark items might not contain sufficient detail in order to elicit thorough findings and recommendations for incident investigation reports. As a result, it is recommended that the facility evaluate its incident investigation procedures in order to ensure that incident investigation findings and recommendations are well-developed, and to ensure that impacted employees and contractors are sufficiently informed about incident investigation findings.

Incident Investigation procedures are required to be implemented when a catastrophic release or near-miss event occurs. The facility’s template Incident Investigation form, however, would not sufficiently document findings and recommendations, and ensure that they are adequately addressed and resolved, as required by 40 CFR 68.81(d)(5) and 40 CFR 68.81(e). It is recommended that the facility evaluate its Incident Investigation procedures in order to ensure that all Incident Investigation requirements would be addressed for catastrophic and near-miss events.

#### **Employee Participation [40 CFR 68.83]**

Although the facility has an Employee Participation Plan, it is recommended that the facility evaluate and implement its contents. Specifically, employees felt inadequately trained to handle emergency operations, including donning of SCBAs and troubleshooting of chlorine cylinders, because sufficient safety and emergency operation training have not been performed frequently enough.

#### **Contractor Safety [40 CFR 68.87]**

Facility management indicated that they are not involved in the selection of contractors to work at or near the chlorine process. Rather, facility management indicated that such decisions are made by PRASA’s purchasing department. It is recommended that this practice is reflected in the facility’s procedures and policies and implemented when contractors are used at or near the chlorine process. Additionally, please be reminded that a periodic evaluation of contractor training, safety requirements, and safe work practices must be performed whenever contractors are used at or near the chlorine process.

#### **Emergency Response [40 CFR 68.90 – 68.95]**

During the inspection, facility personnel indicated concern regarding the training of operators in emergency response procedures. It was also indicated that a single operator

is on shift after 4PM, and that emergency response might not be safe for the responder when there is a single operator on-shift. EPA has previously expressed these concerns to PRASA management in March 2011. As a result, it is recommended that the facility evaluate whether it wants to maintain first responder status, given the concerns identified above, and revise the emergency response program to reflect the determination your facility will make.

As previously mentioned in this report, it is also recommended that the facility further its efforts in coordinating emergency response efforts with local response authorities for larger scale releases and other release scenarios (i.e. chlorine concentration greater than 9 ppm) for which facility personnel are not adequately trained for. Although the facility relies on local emergency response authorities for these efforts, drills and exercises with these authorities can ensure that all involved are adequately prepared for such scenarios.